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Verbal-Visual Interactions and Translation Practice in Multimodal Museum Space: A Case Study of *City Landmark City Story* Exhibition at Guangzhou

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ABSTRACT

With the development and proliferation of new digital technologies, multimodal presentation has increasingly become a common practice in museum exhibitions. However, museum translation has yet to fully adapt to the trend of escalating complexity of texts and modality. The issue of disruptions in the coordination and interaction between verbal and visual modes in museum translation has not received sufficient attention either in practice or in studies. Against this backdrop, the present study seeks to investigate the verbal-visual interactions and their impact on translation in multimodal museum contexts by drawing on the analysis model for modal relations proposed by Zhang Delu in his Synthetic Framework for Multimodal Discourse Analysis. The case study was carried out at the 'City Landmark, City Story' exhibition hall, the Guangzhou Museum in China. The findings reveal that the verbal-visual interaction patterns may be preserved or newly created, or weakened in enhancing effect due to translation. In other words, translation strategies have the potential to reshape verbal-visual relations. The significant implication for multimodal translation studies lies in its fresh perspective of using MDA as an analytical tool and linking inter-modal interactions to translation problems. Practically, it advocates an awareness of verbal-visual interdependence and a set of flexible, multimodal and

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context-sensitive translation strategies in museum translation. It also offers valuable guidance for policy-making and service enhancements within museums.

1. Introduction

Museums have traditionally been conceived as repositories of knowledge and the key sites for the preservation and transmission of human civilization. Chinese museums have achieved unprecedented development, and China has attached greater importance to the role of museums as the venues or channels for cultural dissemination, by advocating the national strategy of 'Chinese culture going global' and the concept of 'Telling Chinese stories well' [1]. Most museums in China provide bilingual or multilingual translations simply to attract more international visitors [2]. Translation, therefore, plays a critical role in making museums more inclusive, diverse, and accessible to overseas tourists and thus deserves an in-depth study.

Notably, a multimodal approach incorporating various sensory channels, verbal, visual, auditory, spatial, etc., to make visiting more engaging, interactive and immersive has increasingly been a common practice in museums worldwide [3,4]. As such, the issue of museum translation goes beyond mere inter-lingual transformation. Instead, it means a complex process involving multimodal presentations where verbal texts are complemented by visual and spatial elements, thus enhancing comprehension and engagement for international visitors with cultural exhibits [5,6].

However, museum translation practices have yet to fully adapt to the trend of escalating complexity of texts and modality. Challenging translation issues in Chinese museums arise from the growing prominence of multimodalities, particularly in areas such as misalignment between translated texts and media, the omission or oversimplification of culture-loaded terms, and the oversight of the verbal-visual collaboration. In other words, the verbal-visual interactions and their impact on translation have not received sufficient attention. This problem is further compounded by linguistic and cultural disparities between Chinese and English [7,8].

However, the literature review shows that this issue remains largely unresolved. First and foremost, the majority of previous studies on museum translation focus on monomodal perspectives, essentially micro-linguistically oriented, with written texts in museums as source text data and equivalence as goal of translation [9,10]. Comparatively, multimodal perspectives in museum translation have yet to receive enough scholarly attention so far [11].

Fortunately, the significant progress in multimodal discourse and visual analysis and the rising attention to multimodality in Translation Studies in recent years have inspired some museum translation researchers [11–14]. Limited in number, though, they touch upon such topics as the multimodal features of museum translation [15,16], museum communication as a multi-semiotic event [17–20], and the deployment of digital technology in the multimodal presentation of museums [21,22]. However, museum translation studies linking inter-modal interactions with translation in multimodal museum settings remain significantly lacking up to now.

In response to the challenges in practice and to fill the gaps in research, this study seeks to address the issue of verbal-visual interactions and their impact on museum translation and aims to answer the following research questions:

(1) How do verbal texts interact with visual elements before and after translation in multimodal bilingual museums in China?

(2) What shifts occur in the verbal-visual interaction patterns due to translation and how does translation reshape these interaction patterns?

(3) What may cause the changes in verbal-visual interrelations after translation?

To answer these questions, this study, theoretically grounded in Zhang Delu's analysis model for modal relations [23,24], adopts a qualitative research design based on a case study, with the *'City Landmark City Story'* exhibition at Guangzhou Museum serving as the selected case.

2. Theoretical Framework: Analysis Model for Modal Relations in MDA & Multimodal Translation Studies in Museums

To answer the research questions, this study draws on the analysis model for modal relations proposed by Zhang Delu in his Synthetic Framework for Multimodal Discourse Analysis to investigate the verbal-visual interaction patterns in the source and target languages and then bridges inter-modal interactions and translation by incorporating insights gained from multimodal translation studies so as to find out how translation reshapes inter-modal relations[23,24].

2.1. The Analysis Model for Modal Relations in the Synthetic Framework for Multimodal Discourse Analysis

Multimodal discourse analysis (MDA) has emerged as a key field, acknowledging that meaning-making involves more than just language, but also multiple semiotic resources[12,25]. The Synthetic Framework for Multimodal Discourse Analysis proposed by Zhang Delu was first formulated in 2009 and improved in 2018. Grounded in Systemic Functional Linguistics (SFL) and inspired by Martin (1992) and Lim (2004)[26,27], Zhang's framework for MDA, the optimized one, comprises five analytical layers: the context of culture, semantic meaning, lexis and grammar, media, and substance. One of its emphases is interactions between interpretation modes[24].

In his framework, the relations between different modes can be generally divided into intersemioticity and re-semiotization[24]. Intersemioticity involves interactions between different modes, while re-semiotization refers to using new semiotic systems for meaning-making in multimodal texts. Early models in MDA, as mentioned before, focus either on the visual analysis or text-image relations whereas Zhang (2009) expands on them by introducing a more intricate approach applicable to the analysis of relations between various modes[23]. He categorizes them generally into two types: complementary and non-complementary, with their specific sub-categories, as illustrated in **Figure 1**[23].
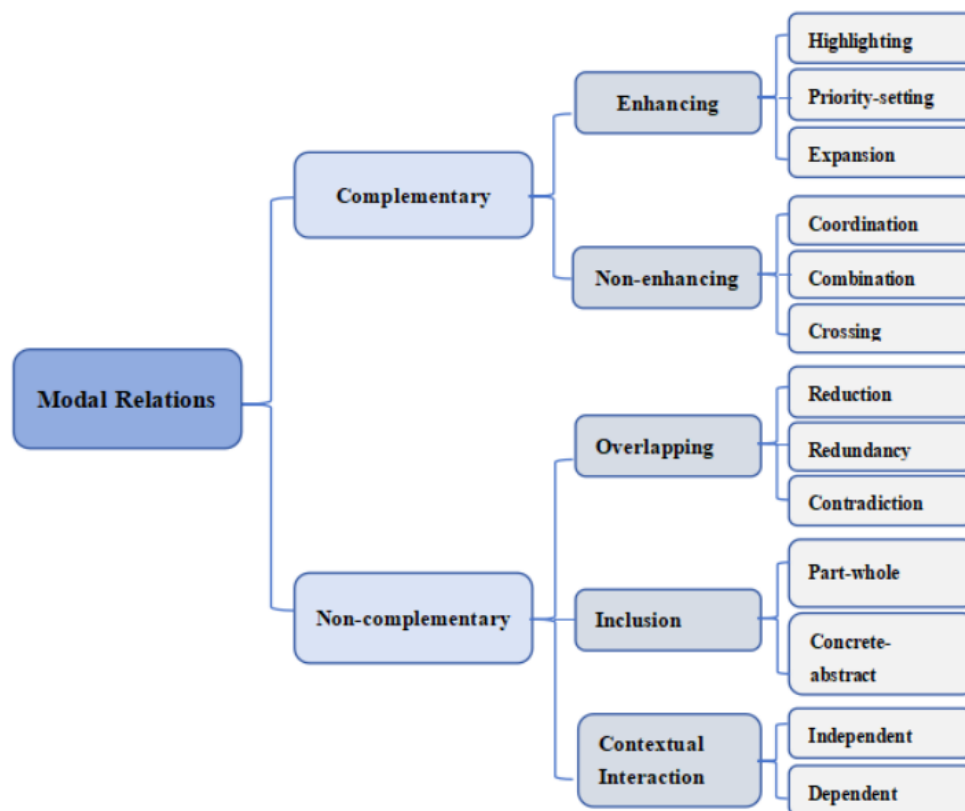

Figure 1. The Analysis Model for Modal Relations in DA[23].

Complementary relations can be further assorted into enhancing and non-enhancing ones. As the name suggests, enhancing relations refers to the scenario when one mode is dominant while the other enhances the representation of the dominant mode. During a speech, for example, language may be the dominant mode while gestures enhance the verbal mode. Enhancing relations can again be classified into highlighting, priority-setting, and expansion. For instance, in a specific example of wall panel, the modal relation between group texts and indirect visual elements such as the color, paintings, lighting, etc., can be complementary-enhancing-priority setting because in this scenario, the physical texts play a dominant role by providing detailed information while the indirect visual elements just enhance the communication as a mood creator. Non-enhancing relations, apparently, mean that two modes are both indispensable and complement each other, with a particular example of the co-occurrence of auditory and visual channels. Similarly, three subdivisions are included, namely coordination, combination, and crossing[23].

Non-complementary relations refer to the situation where mode B does not complement or make contributions to mode A in meaning-making but they occur concurrently anyway. Such relations include overlapping, inclusion, and contextual interaction. Overlapping happens when various modes occur simultaneously but do not complement each other. It can be further divided into redundancy, reduction, and contradiction. Such overlapping is often passive and irresistible. Inclusion signifies that mode B does not add a new dimension to the overall picture, but rather provides more detailed information to mode A. Contextual interaction is seen as the relation between passive and active modes. In other words, context, the passive mode, can be either independent from or involved in representation or communication[23].

Grounded in SFL, this model transcends previous models concentrating on image-text relations, covering a wider range of modes. As such, it is a more intricate and inclusive analysis model for interactions between modes, particularly well-suited for the investigation of interaction patterns between verbal texts and visual elements in multimodal museum spaces.

2.2. Bridging Multimodal Discourse Analysis and Translation Studies in Museum Contexts

Translation, though inherently multimodal as any other form of communication, has traditionally been viewed as a primarily verbal activity[11]. While multimodality has increasingly been taken as an analytical framework and gained fruitful achievements in areas like discourse analysis and visual analysis, multimodal analysis in translation studies has only started to attract the attention of scholars of translation studies in the recent two decades. Existing literature shows that translation studies have engaged with multimodality in two major ways. One is the conceptualization and construction of methodological framework with insights from MDA for translation studies. The other is the application of multimodal approaches, particularly theoretical and methodological frameworks in MDA, to the study of multimodal translated texts[14].

The conceptualization of multimodal translation has experienced an evolving process from Jakobson's (1959) intersemiotic translation focusing on an interpretation of verbal signs by means of nonverbal signs, to Toury's (1986) intersemiotic translation to include both translation between non-verbal systems and that between verbal and non-verbal sign systems, and further to Kaindl's (2013) more comprehensive typology: intramodal & intermodal; intramedial and intermedial; intracultural & transcultural, as stated in Pan et al. (2023)[11]. Boria et al. (2020) is one of the first book-length studies of translation and multimodality, or the use of multiple channels of communication in a text. With contributions from world-leading scholars from different disciplines, it reconceptualizes translation as a multimodal semiotic act beyond verbal transfer and underscores the need for new terminology and methods to address meaning-making across modes[28]. These conceptual refinements mark a significant expansion in translation studies, recognizing the integral role of multiple modes in communicative meaning-making and offering a broader theoretical foundation for multimodal translation research in museum contexts.

Paralleling the conceptualization of multimodality in translation studies, the application of multimodal approaches to the analysis of intersemiotic translated texts is also ex-

panding in the field. Translation studies have gained great insights particularly from visual grammar by Kress and van Leeuwen (1996) and image-text relation by Martinec and Salway (2005)[12,13], both based on Halliday's SFL, and made some achievements especially prominent in audiovisual translation, advertising translation, game translations, webpage translation and picturebook translation[14].

Multimodal discourse analysis (MDA) provides a valuable analytical framework for understanding how different modes function interdependently in meaning-making. Originating from social semiotics and systemic functional linguistics, one of the focuses of MDA is the complex interaction between the modes[29], i.e., how semiotic resources—such as language, image, sound, and space—work together in communicative events[30]. This study is inspired by this approach, utilizing MDA as an analytical tool to examine translation issues in multimodal museum spaces. And it is justified by the multi-semiotic and multimodal features of museum environment where meaning is constructed through verbal descriptions, visual representations, spatial arrangements, and interactive digital elements. The museum context exemplifies multimodal ensembles[30], where different modes function complementarily, hierarchically, or even in tension. Compared with other models in MDA, such as Martinec and Salway (2005)'s image-text relation[13], the analysis model for modal relations by Zhang (2009) is more intricate and inclusive and thus fits well with the investigation of verbal-visual interactions and their implications for museum translation[23].

Museum represents a complex multisemiotic environment[17]. Recent advances in museum studies and museum translation studies further enrich this multimodal approach. Ravelli (2006) introduces a communication framework for analyzing museum texts based on organizational, interactional, and representational meanings. Her model highlights how written language interacts with layout and design to construct multimodal narratives[31]. Neather (2021) argues that museum is more a translation zone than a contact zone, emphasizing translation's central role in mediating intercultural encounters within exhibition spaces[32]. This view shifts translation from a peripheral function to a core component of meaning-making in museums, which aligns with the aim of this study: examining how translation reshapes inter-modal relations in multimodal museum space. Taken together, these perspectives contribute substantially to enriching and consolidating the theoretical framework adopted in this study.

3. Methodology

To address the research questions, this study adopts a qualitative research design, with a case study of the *'City Landmark, City Story'* exhibition hall at the Guangzhou Museum in China. Data collection is conducted through multiple field trips to the museum, involving observation and note-taking, photographing, recording, and scanning QR codes. Data processing involves editing, categorizing, and transcribing. Data analysis is carried out with reference to the analysis model for modal relations in MDA.

3.1. Reasons for Case Selection

Since the present study aims to investigate translation in multimodal museum space, focusing on verbal-visual interactions and their impact on translation, the selection of cases for the study should take into account such factors as the multimodality and Chinese-English translation. Considering this, the *'City Landmark, City Story'* exhibition hall at the Guangzhou Museum is an ideal case to serve the research aim as it is highly representative and typical with the wide coverage of various modes in exhibition, the ample provision of high-quality English translations and the rich cultural connotations.

The Guangzhou Museum, ranked as a national first-class museum, is a comprehensive museum, located in Guangzhou city, one of China's four first-tier cities, and one of the core cities of the Guangdong-Hong Kong-Macao Greater Bay Area, which is the most economically and socially advanced region in China[33]. Due to the developed museum industry, advanced digital technologies are applied extensively in the Guangzhou Museum, leading to a wider and deeper coverage of various modalities. The *'City Landmark, City Story'* exhibition is not an exception, in which physical texts, audio guides, videos, animations, artifacts, pictures, models, lighting, color and other spatial elements, all work together to give a vivid and full display of the city's long history and splendid culture from the Neolithic Age to 21st century. The abundance of culture-specific terms presents a greater challenge for translation, making it a more representative case for museum translation study. More-

over, the emphasis on foreign language proficiency, well-developed bilingual public services, and geographic proximity to Hong Kong and Macao further highlight the city's international outlook, making Guangzhou Museum an ideal case for museum translation study.

The selection of specific examples for data analysis is determined by a comprehensive consideration of the research questions, analytical framework, and Dean's (1994) classification of museum texts[34], while ensuring the representativeness, typicality, and adequacy of samples. Accordingly, this study selects one exhibition panel and one display case as specific cases for data analysis. Each of these two multimodal ensembles encompasses a diverse and adequately representative set of verbal and visual modes, and their content aligns closely with Guangzhou's historical identity as a millennium-old commercial metropolis. The selected cases are: (1) the main thematic panel of the exhibition room, *A World-renowned City*; (2) the display case, *Religion Development from the Jin Periods to the Song and Yuan Dynasties*.

3.2. Data Collection & Processing

Data needed in this study have been collected through two field trips to the Guangzhou Museum by the researcher, in September 2024 and January 2025. Inside the museum, data collection is concentrated on the distinctive permanent exhibition area, the *'City Landmark, City Story'*. The data is gathered via field observation and experience, photographing, recording, and scanning QR codes. All of the data collection is conducted in publicly accessible areas with care and adherence to museum rules and ethical standards. The instruments utilized in the process of data collection include smartphones, cameras, USB drives or similar data storage devices, notebooks, and AR glasses rented in the museum, etc.

Considering the research questions, data collection is primarily focused on the verbal texts and the visual elements, which are identified and photographed by the author. The physical texts, i.e., written texts, are those texts on the wall panels and object labels, including titles, subtitles, introductory texts, group texts and labels, referring to Dean's (1994) division of museum text types[34]. The visual elements include the objects, the models, and the graphs, among others. Data from the audio guides, the videos or animations, leaflets,

brochures, and the official WeChat mini program of the museum are not included in the scope of collection but serve as references for the author to understand the multimodal components in the museum as a whole. It's noteworthy that all data concerning verbal texts to be collected includes both Chinese and English, as available in the museum.

The collected data is prepared for analysis through several steps. Field notes are compiled from observations, photographs, and recordings. Transcribing software (e.g., FIF) and OCR tools are used to convert audio recordings and images into text for analysis. The data preparation also involves classifying and describing the existing modalities in the Guangzhou Museum. This classification serves as a foundational basis for the whole study. All data is processed and analyzed in a scientific way and in accordance with museum rules and ethical standards, ensuring the reliability and validity of the data for subsequent analysis.

3.3. Analytical Framework

To achieve the research aim, Zhang's (2009) analysis model for modal relations in his Synthetic Framework for MDA is employed to form the analytical framework of the study[23]. In Zhang's model, the intermodal relationships fall into two major types: complementary and non-complementary, each with several hierarchical subcategories. This analysis model is utilized to analyze the differences in verbal-visual interaction patterns before and after translation to find out how translation reshapes the inter-modal relations. Overall, the case-based qualitative analysis with the guidance of relevant theories is conducted to answer the research questions and meet the research objectives.

The analysis of these examples follows a structured process:

(1) Describing the selected wall panel or display case, including the positioning, the theme, the verbal elements and the visual elements.

(2) Examining the multimodal relationships between the Chinese verbal texts (i.e., the ST) and visual elements within each case.

(3) Comparing the Chinese and English texts (i.e., the Source Texts & Target Texts) to analyze specific translation strategies employed.

(4) Investigating the multimodal relationships between the

translated English texts (i.e., the Target Texts) and the corresponding visual elements.

(5) Identifying shifts in verbal-visual relationships after translation by comparing pre- and post-translation interaction patterns

(6) Analyzing the underlying causes of the changes in modal relations.

(7) Synthesizing findings and providing suggestions for museum translation in multimodal contexts.

4. Verbal-Visual Interactions and Translation: Case-Based Analysis

With the data well prepared, two specific cases, the introductory wall panel: A World-renowned City, and the display case: Religion development from the Jin periods to the Song and Yuan dynasties, are analyzed within the aforementioned framework to find out the changes in interaction patterns between verbal and visual modes due to translation.

4.1. Case 1: The introductory Wall Panel: *A World-Renowned City*

The wall panel titled "*A World-renowned City*" is located at the entrance of the exhibition room on the 4th floor of the *'City Landmark City Story'* exhibition area in Guangzhou Museum. This floor presents Guangzhou's history during the Ming and Qing Dynasties, centering on its role as a prominent international trading hub. The panel serves as a general introduction to the entire exhibition room, highlighting Guangzhou's significance in global trade and cultural exchange. The panel texts in this case, both the Chinese Source Texts (hereinafter ST) and the English Target Texts(hereinafter TT), include the title texts and introductory texts according to Dean's typology[34], and are presented in full in **Supplementary Materials S1**.

In terms of layout and design, the panel is dominated by verbal texts, with both Chinese and English texts occupying approximately 70% of the panel's space. The main heading " " (A World-renowned City) in Chinese, which functions as the title in Dean's (1994) typology[34], is displayed in bold, raised characters, emphasizing the overarching theme. Below the heading, the introductory texts in both Chinese and English provide a concise historical overview of Guangzhou's commercial and cultural promi-

nence. The visual elements are located at the upper, middle and lower edges of the panel. The upper illustration features the Thirteen Hong area (a key historical trading district in Guangzhou) and the busy port scene, depicted in a stair-shaped recess, which enhances its spatial prominence within the panel. Positioned toward the right side between the Chinese and English texts, a European-style clock further reinforces Guangzhou's historical role as a major hub for international trade and cross-cultural exchange. The lower illustration showcases a traditional cityscape with the Zhenhai Tower at the center, representing Guangzhou's cultural and architectural heritage. These verbal and visual components work together to introduce visitors to the core theme of the exhibition room while visually reinforcing the dual identity of the city as both a commercial hub and a site of rich historical heritage.

The panel serves as a comprehensive introduction to this exhibition room, with the verbal mode taking precedence in conveying the historical narrative. The title "*A World-renowned City*" in Chinese is prominently displayed in raised relief lettering, visually reinforcing the core theme of this exhibition room and exemplifying priority-setting in verbal level by directing visitors' focus. The visual elements function as supplementary enhancements to the texts. The upper illustration of the Thirteen Hong area, corresponding to the text's reference to Guangzhou's flourishing foreign trade, is not a dominant focal point but rather a background visual aid that reinforces the city's historical role as a trading hub. Its stair-shaped recess design adds visual depth and spatial engagement, enhancing its aesthetic appeal. The lower illustration of traditional Guangzhou architecture complements the text's depiction of the city's cultural and economic development, further embedding historical context. Positioned between the Chinese and English texts, a small yet distinctly European-style clock subtly reinforces the theme of foreign trade and Sino-Western commercial interactions without overshadowing other elements, thereby enriching the multimodal interplay. According to Zhang's (2009) analysis model[23], the interrelation between the verbal and the visual modes can be seen as complementary-enhancing-priority-setting in the case when one mode is apparently the dominant mode for conveying information while the other is just an auxiliary mode. Inferred from that, the modal relation between the Chinese text and visual elements in this panel follows a

complementary-enhancing-priority-setting relationship.

A comparison of the Chinese texts and the English texts finds that the majority of the translated texts closely follow the source text through literal translation, aligning with the communicative function of museum texts, which is to present cultural and historical knowledge objectively and comprehensively. Only a few culturally specific terms, Ming dynasty and Qing dynasty, were translated with additional explanation, including their respective time frames in parentheses. This adjustment considers the prior knowledge gap of international visitors. International visitors may lack the contextual background to fully interpret the references while Chinese audiences are generally familiar with them. Despite these minor modifications, the translated text remains the dominant mode, with visual elements serving a supporting and reinforcing role. The illustrations help guide international visitors' attention, providing visual cues to aid comprehension. These subtle textual refinements do not alter the overall modal structure, ensuring that the inter-modal relationship between the English text and visual elements remains the same as the original one: complementary-enhancing-priority-setting. That's to say, in this case, the modal relations are preserved after translation.

To summarize, in this case, the introductory wall panel, the complementary-enhancing-priority-setting relationship between verbal texts and visual elements remains stable after translation due to the predominantly literal translation strategy. Minor modifications, such as the addition of the time frames of different dynasties, do not significantly alter the original multimodal interaction pattern.

4.2. Case 2: The Display Case: *Religion Development from the Jin Periods to the Song and Yuan Dynasties*

The title of this display case, *Religion Development from the Jin Periods to the Song and Yuan Dynasties*, is actually one of the subtitles of the main theme of this exhibition room, *Guangzhou of Peace and Prosperity*, which narrates the history of Guangzhou from the Three Kingdoms period to the Yuan period and is located on the 3rd floor of the Zhenhai Tower. This display case is centered on religious development during those periods, illustrating the frequent contacts between Chinese and foreign merchants and monks and the cultural interactions. This display case contains a

rich bilingual textual layout, comprising wall panel texts and label texts. The full texts, extracted from top to bottom and left to right, are included in **Supplementary Materials S2**.

The display case is structured into two parts: the wall panel and the exhibits. In addition to the title of display case, *Religion development from the Jin periods to the Song and Yuan dynasties*, on the wall panel, four segments are aligned horizontally from left to right in the following order: a rubbing of the portrait of Ge Hong, a list of eminent foreign monks who arrived at Guangzhou via maritime routes during the Jin and Southern Dynasty, depictions of several Buddhist temples and pagodas and an introduction to Islamic sites. Except for the list of foreign monks, which is presented only in Chinese in a table, the other three segments include both images and detailed bilingual texts in Chinese and English. The exhibits in this display case, arranged from left to right, include: Wood carving statue of a Kongrikishi, Wood carving statue of a warrior, Iron statue of a Buddha, Gilt copper statue of a Buddha, White-glazed kendi with lobed rim Ding ware, and Bluish-white glazed kendi. Each artifact is accompanied by a bilingual label in both Chinese and English. The first four statues represent Buddhist figures while the two kendi (spouted vessels) were used in Islamic ritual of purification and were likely commissioned by Arab merchants in Guangzhou.

The title of this display case, *Religion Development from the Jin Periods to the Song and Yuan Dynasties* is presented in large, bold Chinese characters at the top center of the entire panel. Positioned right under the Chinese title is the literally translated title in English in a smaller font, aligning with the conventions of museum industry in China. Below the title are the four segments juxtaposed and distinguished by different background designs. Each of the four segments is independent in content yet highly relevant to the overall theme of the display case. Therefore, the inter-modal relationships between the verbal texts and visual elements need to be analyzed individually.

The first segment, a rubbing of the portrait of Ge Hong, contains both the rubbing image and textual descriptions, which elaborate on Ge Hong's multiple appellations, life experience, achievements and especially his contributions as a Daoist. The Chinese text expands upon the portrait by providing crucial biographical and historical details that the image alone cannot convey and thus enhances the meaning

of the portrait. The verbal and visual modes work together to provide a fuller understanding of the subject. Therefore, according to Zhang's (2009) analysis model[23], the modal relationship between the verbal text and visual elements exhibits a complementary-enhancing-expansion pattern. In translation, the strategies of omission and addition are employed. Ge Hong's birth and death years are omitted, which, the researcher presumes, is most likely an oversight in translation. Additionally, two of his works listed in Chinese text are deleted from translation while a new work *Hagiographics of Divine Transcendents* is added in English text. This modification is likely due to the considerations of spatial constraints and relevance to Taoism as well as the extent of the work's influence. As such, after translation, the overall verbal-visual interaction pattern remains the same as the original one, complementary and enhancing, but the extent of expansion is somewhat weakened.

The second segment on the wall panel, a list of eminent foreign monks who arrived at Guangzhou via maritime routes during the Jin and Southern Dynasties, is illustrated in a Chinese table, consisting of three columns: Dynasties, Names of eminent monks, and Remarks (key events related to their arrival and Buddhism activities). This table provides a chronological summary of foreign monks spreading Buddhism in Guangzhou at that time in a mono-modal way, verbal mode only. And no English translation is provided, which is in accordance with standard practices in Chinese museums.

Following the table of foreign Buddhist monks is the third segment, Buddhist temples and pagodas in Guangzhou, which is presented on an eye-catching circular raised background panel with both textual descriptions and corresponding images. It is composed of the Flowery Pagoda of the Six-Banyan Temple, the Yifa Pagoda of the Guangxiao Temple, the Stele of the Portrait of Bodhidharma, and the Hall of Five Hundred Arhats in Hualin Temple, each accompanied by historical and architectural information. The Chinese texts expand on the images by providing historical details, names, and functions of these Buddhist sites, which are not evident in the visuals alone. So the inter-modal relationship between the Chinese texts and the visual elements follows complementary-enhancing-expansion based on Zhang's (2009) analysis model for modal relations[23]. On the whole, literal translation strategy is adopted in translating Chinese

texts in this segment, preserving most historical and factual details. Though minor omissions and slight restructuring occur for fluency, the essential modal relation between translated texts and visual elements remains largely unchanged, retaining the complementary- enhancing- expansion pattern.

The last segment on the wall panel introduces Islamic sites in Guangzhou, specifically Huaisheng Mosque and the Mausoleum of Ancient Islamic Sage, with a combination of detailed Chinese and English texts along with two historically significant pictures. The visual elements depict the architectural features of these sites, reinforcing their historical and cultural significance. The texts expand upon the pictures by providing historical context, such as the history of the introduction of Islam to Guangzhou, the construction of the mosque, important details about the missionary burial site, etc. Rich cultural information of this kind is not likely to be observed from the pictures alone. Therefore, drawing on the analysis model by Zhang Delu, the inter-modal relationship between the Chinese texts and the visual mode is complementary-enhancing-expansion. Little information loss exists in the translation because literal translation strategy is primarily adopted. As such the interaction pattern is preserved after translation.

Aside from the wall panel texts, this display case also contains six artifacts: Wood carving statue of a Kongrikishi, Wood carving statue of a warrior, Iron statue of a Buddha, Gilt copper statue of a Buddha, White-glazed kendi with lobed rim Ding ware, and Bluish-white glazed kendi. The first four are Buddhist statues while the last two are objects used in Islamic practice. Each artifact is accompanied by a bilingual label in Chinese and English, providing the name of the exhibit and a brief description. However, the information density varies across the labels. The first three artifacts, Wood carving statue of a Kongrikishi, Wood carving statue of a warrior and Iron statue of a Buddha, contain only basic details, including the exhibit's name, the dynasty in which it was made, and the time and location of its excavation. The corresponding English translations primarily follow a literal approach, with the only addition being the specific years of the dynasty. As a result, both the Chinese and English texts exhibit a complementary-enhancing-expanding relationship with the visual mode. Regarding the fourth artifact, the situation is different. The label texts in Chinese include a short paragraph on the history of the spread of Buddhism in China,

particularly in Guangzhou aside from the exhibit's name and dynasty. This establishes a complementary-enhancing-expanding relationship between the Chinese text and the visual mode. However, the English translation omits the paragraph of the historical account, retaining only the exhibit's name and dynasty (with the dynasty's years added), significantly reducing the information density. According to Zhang's (2009) analysis model for modal relations [23], this omission shifts the relationship between the English text and the visual mode to complementary- non-enhancing-coordinating.

The fifth and sixth artifacts, both Islamic objects, also have bilingual labels. The Chinese label texts for the fifth artifact, White-glazed kendi with lobed rim Ding ware, encompass the exhibit's name, the dynasty and one-sentence interpretation text. The exhibit's name provides details on the kiln origin, material, glaze type, shape, and vessel type and the interpretation text provides additional context, mentioning its ritual use for Islamic hand washing and its customization for Arab merchants. Therefore, according to Zhang's (2009) intricate classification of inter-modal relations [23], Chinese label texts and the visual mode maintain a complementary-enhancing-expansion relationship. However, the English translation only includes the exhibit name and dynasty, again with the addition of specific years, omitting the functional description. The exhibit's name is literally translated into English. However, for the English word kendi in the exhibit's name, common international visitors may not be familiar with the term or its Islamic associations, as kendi is primarily recognized as a Southeast Asian vessel rather than one specifically tied to Islam. What's worse, the omission of the interpretation text in translation makes the exhibit's association with Islam more ambiguous. This omission reduces the information density of the English text, making its relation to the visual mode complementary-non-enhancing-coordinating. The sixth exhibit, similar in function and naming conventions to the fifth, has a label in both Chinese and English that includes only the exhibit name and dynasty, without additional descriptive words. Consequently, the relationship between both the Chinese and English texts and the visual mode is complementary-non-enhancing-coordinating.

In summary, the types of inter-modal relations between verbal and visual modes and the impact of translation on modal relations are varied in this multimodal

ensemble and have been analyzed individually. Overall, the complementary-enhancing-expansion pattern is the most prevalent, both before and after translation. The complementary-non-enhancing-coordination pattern is also present, but it appears more frequently after translation. Due to the adoption of certain translation strategies, the modal relations between verbal texts and visual elements may be preserved, newly created or reduced in effect, compared with the original Chinese ones.

5. Findings & Discussion

Building on the case-based analysis in the previous section, the findings reveal that verbal-visual modal relations in multimodal museum spaces predominantly follow the complementary pattern, with diverse subcategories. Translation plays a role in reshaping these relations. The original inter-modal relations may be preserved, or weakened, or newly created. Furthermore, a correlation exists between translation strategies and modal relations, though not in a fully predictable manner, necessitating detailed analysis. This section presents key findings on these intermodal interactions and their implications, followed by a discussion on the factors influencing modal shifts and recommendations for multimodal museum translation.

5.1. Findings

Based on the exploration of the verbal-visual modal relationships in the two cases—the introductory wall panel on *A World-renowned City* and the display case on religion development by drawing on Zhang's (2009) analysis model for modal relations [23], it is found that the complementary-enhancing-expansion pattern appears most frequently while the complementary-non-enhancing-coordinating and complementary-enhancing-priority-setting patterns are also observed both before and after translation. Additionally, due to translation, the inter-modal relations may be preserved; new interaction patterns may emerge while others may be reduced or disappear at all. In other words, translation strategies have the potential to reshape modal relationships.

The first situation is that the inter-modal relations are basically preserved after translation. The preservation of modal relations is primarily achieved through literal transla-

tion and transliteration plus explanation etc. Literal translation is the most commonly employed translation strategy in exhibitions, as it maximally preserves the informational content of the original Chinese text. By maintaining the original verbal content, it effectively ensures that the inter-semiotic interaction pattern remains intact, keeping the verbal-visual interaction pattern unaltered. For example, in above case of the wall panel *A World-renowned City,* a complementary-enhancing-priority-setting interaction pattern remains unaltered after translation. Transliteration with explanation is another commonly used translation strategy in museum translation, primarily applied to culturally specific terms that lack direct English equivalents. This approach takes into account the prior knowledge of international visitors, ensuring accessibility while maintaining the original multimodal interaction patterns. Apart from literal translation and transliteration with explanation, the addition of corresponding years in parentheses to dynasty names in translation is widely adopted in museum translation practice in China. This strategy helps preserve the original modal relations by addressing the differing levels of familiarity with dynastic chronology between Chinese and international visitors. Dynasty-related information may occur in different levels of museum texts, such as wall texts and label texts. Regardless of the translation of other parts of museum texts, this specific addition does not fundamentally alter the original modal relations.

Beyond preserving the original modal relations in translation, certain translation strategies may lead to the reconstruction of intermodal interactions, sometimes resulting in unintended shifts. This new creation of modal relations is most frequently seen when omission is adopted in translation due to concerns about spatial constraints. By removing explanatory details from the English version, the translated texts no longer reinforce or expand upon the visuals, altering the intended multimodal meaning-making process. This is illustrated by the translation of label texts of the fourth, fifth and sixth artifacts in the display case: Religion development from the Jin periods to the Song and Yuan dynasties, where the verbal-visual interrelations are shifted from complementary-enhancing-expansion to complementary-non-enhancing-coordination. Another situation in which translation reshapes modal relations is the misplacement of core verbal information during translation, where the translated text shifts the focus of meaning away

from the original. A notable example can be observed in the label for the exhibit *Bronze Clepsydra (   )* in the exhibition room *Hub of the East*. *Bronze Clepsydra* is a timing instrument used in Yuan Dynasty.

The Chinese name on the exhibit label only indicates its material and shape, while its functional category—timekeeping device—is conveyed in the explanatory text along with a classical poem closely related to this function. However, the exhibit's name in English is a pure literal translation, *Bronze Clepsydra*, while omitting the whole explanatory text. As a result, the core meaning of the timekeeping device is completely lost, leaving non-Chinese visitors with no clues to infer its function or understand what it is really for. Thus, translation in this case shifts the verbal-visual interrelations from complementary-enhancing-expansion to non-complementary-inclusion-abstract& concrete. Such unintended transformations can alter visitors' understanding of the exhibit, limiting their ability to grasp its cultural and functional significance.

Along with the preservation and creation discussed above, another possible outcome of museum text translation is the weakening of verbal-visual modal relations, possibly due to omission, transliteration without annotation or explanation, and redundant transliteration. Omission of some information is a common practice in museum translation due to the spatial constraints. In some cases, it may lead to incomplete information in translation and thus weakening or reducing the enhancing effect. The first segment, *a rubbing of the portrait of Ge Hong*, in the display case, *Religion development from the Jin periods to the Song and Yuan dynasties*, is a case in point. Transliteration without annotation fails to convey essential cultural meanings, reducing intermodal connections and weakening the intended interaction. Redundant transliteration can further hinder comprehension, making verbal-visual coordination less effective. These strategies, if not skillfully handled, diminish the multimodal communicative function of museum translations.

Although a certain correlation between translation strategies and changes in verbal-visual relationships has been identified, there is no absolute correspondence between the two. Museum space represents a complicated multimodal environment and as such, how translation reshapes intermodal relations should be examined on a case-by-case basis. However, one thing remains almost certain: the verbal-visual

interactions generally fall within the category of 'complementary' rather than 'non-complementary' relations, as classified by Zhang Delu (2009)[23], whether before or after translation, even though the subcategories may be varied. That is, the verbal and visual modes coordinate and supplement each other, jointly constructing the cultural meanings in multimodal museum spaces.

5.2. Discussion: Causes of Changes in Verbal-Visual Relations

Building on the findings, it is shown that translation plays a crucial role in reshaping verbal-visual interaction patterns in multimodal museum space, leading to the reconstruction of inter-modal relations, either preserving, newly creating or weakening the original modal relations. These changes stem from spatial constraints, cultural differences, and the museum industry conventions, all of which collectively influence the selection and application of translation strategies. The key causes of changes in verbal-visual interrelations due to translation can be explained by drawing on Zhang's (2009, 2018) synthetic framework for multimodal discourse analysis (MDA)[23,24], particularly its five analytical layers—context of culture, semantic meaning, lexis and grammar, media, and substance.

In alignment with the media and substance layers in Zhang's (2009, 2018)[23,24], spatial constraints, as a key factor influencing museum translation, often necessitate textual omission or condensation, thereby altering verbal-visual relations. Given that Chinese is more compact than English, translations must often be shortened to fit the space of the exhibit labels and panels, potentially disrupting multimodal meaning-making[17]. As discussed earlier, the *Bronze Clepsydra* exhibition is a case in point. However, beyond reducing verbal texts, spatial constraints also shape information prioritization in museum narratives[35]. The need for condensation in museum translation requires curators and translators to make strategic choices in retaining core details, inevitably reshaping interpretative frameworks. This often shifts the burden of meaning-making onto visual elements, which may reinforce or even alter verbal-visual relations[36]. In some cases, omitted verbal details are compensated through images or spatial design, thereby illustrating how museums function as "contact zones" where multimodal constraints drive dynamic interactions[37]. Thus, museum translation is

not merely linguistic transfer but a reconfiguration of multimodal relations to maintain coherence within the exhibit's physical and semiotic space[38].

In addition, as one dimension of the context of culture in Zhang's (2018) five-layered analytical framework for MDA[24], cultural differences shape translation strategies and impact verbal-visual interactions. Zhang (2018) argues that culture, as the total meaning potential, determines the selection of semiotic modes, how they interact, and the rules governing their operation in specific social contexts[24]. In museum translation, cultural context influences translation strategy selection and how different modes collaborate to convey cultural information. Being aware of the lack of direct equivalents in English for culture-specific expressions in Chinese exhibitions, the limited space available and the greater spatial demands of English compared to Chinese, translators must be deliberate and strategic in selecting translation methods to balance the adequate transmission of cultural meaning with spatial aesthetics, which subsequently alters verbal-visual modal interactions. Particularly for international visitors with limited cultural background knowledge, reductions or adjustments in the verbal texts may shift the way information is accessed, making the visual mode more dominant in meaning-making and thus affecting the overall multimodal experience.

Apart from spatial constraints and cultural gaps, the conventions of museum industry also play a crucial role in determining translation strategies, thereby potentially leading to the changes in the verbal-visual interaction patterns. Museum texts, especially label texts, are often informative on the one hand and concise on the other, due to spatial constraints, consideration of spatial aesthetics and the limited time visitors spend reading them[17], usually only a few seconds per label[39]. And thus, in museum industry, it is a common practice to omit explanatory texts on the labels and some parts of panel texts in translation. Despite a certain degree of information loss because of omission in translation, the multimodality, along with the intertextuality in multimodal museum space, could compensate for the brevity or the loss of some textual information, thereby mitigating potential interpretive challenges[12,18]. In alignment with the conventions of the museum industry in mainland China, most bilingual and multilingual museums only provide English translations to titles, subtitles, group texts and labels, while most of the in-

terpretation texts on the labels are not rendered. It is for sure that the historical and cultural meanings may be lost more or less, thereby weakening the enhancing effect between the verbal texts and visual elements, and even leading to a complete alteration of the inter-modal relations. As shown in the previous analysis of the exhibit, *White-glazed kendi with lobed rim Ding ware*, the omission of the interpretation text in translation leads to a loss of information about the exhibit's function, thereby shifting the verbal-visual interaction patterns from enhancing and expanding to non-enhancing and coordinating. Such a translation approach and the shift in modal relations, pose greater challenges for non-Muslim visitors, as the visual features alone fail to compensate for the absence of verbal interpretation in the case.

Even with these tricky issues, the City Landmark, City Story exhibition at Guangzhou Museum succeeds in offering a magnificent feast for all visitors by skillfully integrating translation into its multimodal framework and exploiting the affordances and semantic potentials of different modalities. With bilingual texts and multimodal presentation, the exhibition effectively bridges linguistic and cultural gaps, ensuring accessibility for international visitors. For the embedded cultural and historical information that cannot be directly shown by visual elements, texts provide additional information. Meanwhile, visual elements in turn make abstract texts more vivid and easier to perceive. Different media are orderly and carefully distributed in time and space, and thus, the entire exhibition reaches its overall purpose of giving domestic and international visitors a holistic view of the history and culture of the world-renowned city, Guangzhou.

6. Conclusions

This study draws on Zhang's (2009, 2018) synthetic framework for MDA[23,24], particularly the analysis model for modal relations and the five analytical layers, based on the case study of the *City Landmark City Story* exhibition at Guangzhou Museum. It has explored how the verbal and visual elements interact before and after translation and how translation shapes the intermodal relations in multimodal museum space. The findings indicate that the verbal and visual modes predominantly follow the complementary pattern with varied subcategories, among which the complementary-enhancing-expanding pattern is the most common one. The

verbal-visual interaction patterns may be preserved or newly created, or weakened in enhancing effect due to translation. That's to say, translation strategies have the potential to re-shape verbal-visual relations. The study further reveals that the changes in verbal-visual interaction patterns are caused by spatial constraints, cultural differences, and museum industry conventions, among others. Accordingly, in museum translation in multimodal contexts, translators should be well aware of the interdependence of verbal, visual, and spatial elements and develop a set of flexible, multimodal and context-sensitive translation strategies to improve the adequacy of museum translation but also contribute to a more inclusive and engaging museum experience for both local and international visitors. Moreover, collaboration between translators and curators is necessary to ensure that translation strategies align with the overall museum narrative[40].

This study presents significant implications for both multimodal translation studies and museum translation practice. By drawing on Zhang's (2009, 2018) Synthetic Framework for Multimodal Discourse Analysis[23,24], this study reveals how translation influences verbal-visual interactions and how the interactions inform translation choices. Thus it moves beyond the traditional linguistically equivalence-based orientation and offers a fresh multimodal perspective for museum translation study. Additionally, the innovative angle of using MDA as an analytical tool and linking inter-modal interactions to translation problems advances the field of both Translation Studies and Museum Studies and widens the range of the application of MDA as well.

From a practical perspective, this study suggests that museum translation should not be approached in isolation but rather as an integral part of the multimodal communicative framework. Translation strategies should be developed with an awareness of inter-modal relations, ensuring that meaning-making is not disrupted due to textual omissions or misalignment with visual elements. This demands a flexible use of compensation techniques, for example, highlighting the omitted verbal information through visual or spatial elements, embedding supplementary explanations in multimodal cues, or employing interactive translation tools to enhance visitor comprehension. What's more, the findings suggest a greater need for a closer collaboration between translators, curators, and other stakeholders to ensure that translation strategies align with museum narratives and visitor expectations.

Despite its contributions, this study has certain limitations. The case-based study, limited in scope, may not fully represent multimodal translation practices in diverse museum contexts. Additionally, this research focuses solely on verbal and visual modes, leaving other semiotic modes unexplored. Furthermore, visitors' reception and comprehension of these modal shifts remain largely unaddressed. Future research could expand the scope by comparing multimodal translation practices across different museum types and various modes, incorporating empirical visitor studies, and exploring how emerging technologies, such as bilingual QR codes and interactive digital translation tools, can optimize verbal-visual integration in museum settings.

Supplementary Materials

The supplementary materials can be downloaded at https://journals.bilpubgroup.com/files/FLS-9700-Supplementary-Materials.docx.

Author Contributions

Conceptualization, Y.D. and I.S.Z.; methodology, Y.D. and K.A.B.; writing—original draft preparation, YC.D.; supervision, I.S.Z. and K.A.B.; writing—review and editing, Y.D., I.S.Z. and K.A.B. All authors have read and agreed to the published version of the manuscript.

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Conflict of Interest

The authors declare no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript; or in the decision to publish the results.

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